

Distribution of *Perkinsus marinus* in Gulf Coast Oyster Populations

ALISON CRAIG¹
ERIC N. POWELL
ROGER R. FAY
JAMES M. BROOKS
Department of Oceanography
Texas A&M University
College Station, Texas 77843

ABSTRACT: Prevalence (percent of oysters infected) of *Perkinsus marinus* and infection intensity were measured in oysters from 49 sites in the Gulf of Mexico. Prevalence was less than 50% at only one site. Both prevalence and infection intensity were correlated with condition index, salinity, and a measure of local agricultural activity. The regional distribution of *P. marinus* was patchy on spatial scales of 300 km or less and 1,500 km or more. Three regional foci of infection could be distinguished:- the north central coast of Texas, central Louisiana west of the Mississippi River, and the southwestern coast of Florida. Lowest infection levels were recorded along the north central and northeastern Gulf, particularly east of the Mississippi River. The spatial distribution of infection varied with the salinity regime; however, other factors also explained part of the regional patterns observed. These included factors associated with man's activities such as agricultural and industrial activity and the average annual temperature regime.

Introduction

The protozoan *Perkinsus* (=Dermocystidium) *marinus* is the most important pathogen of eastern oysters (*Crassostrea virginica*) in the Gulf of Mexico and has been implicated as a major cause of mortality in Gulf Coast oyster populations (Quick and Mackin 1971; Hofstetter 1977; Ray 1987). Prevalence of *P. marinus* has been related to salinity and temperature, with low temperatures and salinities usually limiting infection; however, local variations in prevalence and infection intensity are also well described (Ray et al. 1953; Mackin 1962; Ogle and Flurry 1980; Soniat 1985). *P. marinus* characteristically disseminates slowly from centers of infection within an oyster reef complex and spreads even more slowly from reef to reef. Consequently infections are patchily distributed on many reefs, often with uninfected oysters immediately adjacent to infected ones (Andrews and Hewatt 1957; Mackin 1962). Although well studied locally, little information is available on the regional variations in *P. marinus* prevalence and intensity of infection.

The intent of this study was to describe the distribution of *P. marinus* throughout the Gulf of Mexico with particular emphasis on (1) determining the prevalence and intensity of infection of *P. marinus* in the Gulf of Mexico, (2) identifying factors influencing and controlling distribution, and (3) examining patterns of distribution and regional centers of infection. Sampling for this study was accomplished in conjunction with NOAA's Mussel

Watch. The Mussel Watch program is part of NOAA's National Status and Trends environmental monitoring program designed to monitor changes in environmental quality along the Atlantic, Pacific, and Gulf coasts of the United States by measuring levels of chemical contaminants in fish, bivalves, and sediments and identifying biological responses to these contaminants (NOAA 1987a). As part of the Gulf Coast program, prevalence and Intensity of infection of *P. marinus* were measured in oysters collected from each Gulf Coast site.

¹ Present address: E.V.S. Consultants, 2517 Eastlake Ave. E, Seattle, WA 98102.